ECOSYSTEM SCI & SUSTAIN-ESS (ESS)

Courses

ESS 120 Intro to Ecosystem and Watershed Sciences Credit: 1 (1-0-0)
Course Description: Exploration of the fields of Ecosystem Science and Sustainability and Watershed Science, including career pathways.
Prerequisite: None.
Restriction: Must be a: Undergraduate.
Registration Information: This is a partial semester course. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

ESS 129 Information Management for Sustainability Credit: 1 (1-0-0)
Course Description: Learn to access, retrieve, store, and manipulate information for natural resources and sustainability applications. Basic mapping, statistics, and graphing.
Prerequisite: None.
Registration Information: This is a partial semester course. Credit not allowed for both ESS 129 and ESS 180A1.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 130 Intro to Systems Theory for Sustainability Credit: 1 (1-0-0)
Course Description: Introduction to the concept of a "system," fundamental tenets of systems theory, and application of systems theory to the sustainability of social-ecological systems.
Prerequisite: ESS 129, may be taken concurrently.
Registration Information: This is a partial semester course.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 150 Imagining Sustainability Credits: 3 (3-0-0)
Also Offered As: ANTH 150.
Course Description: Science alone cannot imagine the revolutionary changes necessary to sustain future life on our planet. Explore key concepts and practices of sustainability as represented in contemporary fiction, film, and the news media. Interdisciplinary approach will be anthropological and historical, charting the development of sustainability thinking through different epochs of capitalism.
Prerequisite: None.
Registration Information: Credit allowed for only one of the following: ANTH 150, ANTH 181A1, ESS 150, or ESS 181A1.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 210 Physical Geography Credits: 3 (3-0-0)
Also Offered As: GR 210.
Course Description: Energy, mass budget, and human impacts on atmosphere, hydrosphere, and continental land surfaces.
Prerequisite: None.
Registration Information: Credit not allowed for both ESS 210 and GR 210.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 220 Research Skills for Ecosystem Science I Credit: 1 (0-0-1)
Course Description: Fundamental skills for participating in ecosystem science research through hands-on learning modules.
Prerequisite: None.
Registration Information: Written consent of instructor.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 221 Research Methods for Ecosystem Science II Credit: 1 (0-0-1)
Course Description: Advanced topics in the practice of the scientific method and participation in research.
Prerequisite: ESS 220.
Registration Information: Written consent of instructor.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 298 Research Credits: Var[1-3] (0-0-0)
Course Description: Directed ecosystem science research.
Prerequisite: ESS 221, may be taken concurrently.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 311 Ecosystem Ecology Credits: 3 (3-0-0)
Course Description: Principles of ecosystems ecology, emphasis on their application to coupled natural and human systems.
Prerequisite: (PH 121 or PH 141) and (LIFE 320).
Registration Information: Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 312 Sustainability Science Credits: 3 (3-0-0)
Course Description: Synthesize multifaceted information across a wide range of disciplines, with the goal to develop potential solutions to complex human-societal-environmental challenges at multiple scales. Implement methods for understanding current issues, develop alternative scenarios to current practices and policies, and stage interventions to achieve more sustainable behaviors and practices.
Prerequisite: LIFE 320.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 320 Internship and Career Preparation Credit: 1 (0-0-1)
Course Description: Career-related skills and professional development in ecosystem science and sustainability (ESS) for majors.
Prerequisite: LIFE 320.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 330 Quantitative Reasoning for Ecosystem Science Credits: 3 (2-2-0)
Course Description: Understanding diverse approaches for using data and models to understand complex ecological systems.
Prerequisite: (ESS 211 or LIFE 320) and (MATH 155 or MATH 160) and (STAT 301 or STAT 307 or STAT 315).
Registration Information: Junior or senior standing.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 353 Global Change Impacts, Adaptation, Mitigation Credits: 3 (3-0-0)
Course Description: Explore challenges of climate change for mountain environments and society and their solutions.
Prerequisite: LAND 220 or LIFE 220 or LIFE 320.
Registration Information: Required field trips. Credit allowed for only one of the following: BZ 353, ESS 353, or NR 353.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 365 Global Climate Justice Credits: 3 (3-0-0)
Course Description: Explore how mechanisms of environmental transport (air, water, land, biota) act as drivers within different ecosystems and how such drivers create pathways that lead to climate justice issues among the world's vulnerable populations.
Prerequisite: None.
Registration Information: Credit not allowed for both ESS 365 and ESS 381A1.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 382A Study Abroad: Socio-Ecological Landscapes of Mongolia Credits: 6 (0-0-6)
Course Description: Travel to Mongolia for a field-based, place-based experience with Mongolian students and herders. Engage in research projects partnering with Mongolian counterparts for field data collection using ecological, social science, and geospatial tools. Examine the intersection of culture and environment through observational exercises and experiential learning. Experience nomadic culture through field trips and participatory community activity.
Prerequisite: None.
Restriction: Must be a: Undergraduate.
Registration Information: Written consent of instructor.
Term Offered: Summer.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 400 Global Perspectives on Sustainability Credits: 3 (3-0-0)
Course Description: Explores the intersections between ecosystem science, communities and sustainability in the context of the global challenges of climate change focusing on the new global framework (The Paris Agreement), Sustainable Development Goals (SDGs), and ecological indicators.
Prerequisite: ESS 311.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 401 Sustainability of Parks and Protected Places Credits: 3 (3-0-0)
Course Description: Explore connections between culture, sustainability, and park management topics while discussing people, parks, and places through the lens of diversity and inclusion in natural resources.
Prerequisite: None.
Registration Information: Completion of AUCC Categories 2 and 3A.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 405 Global Agriculture and Environmental Change Credits: 3 (3-0-0)
Also Offered As: SOCR 405.
Course Description: Explore the past, present, and future of global agroecosystems in a changing environment. Examine a range of environmental issues facing agroecosystems around the world, including water management, climate change, air pollution, and land use change. Assess the history of agricultural development and the factors that determine food security, as well as what strategies could help create a more sustainable and food secure world.
Prerequisite: BSPM 302 or BSPM 308 or BSPM 361 or LAND 220 or LIFE 220 or LIFE 320.
Registration Information: Offered as Mixed Face-to-Face. Credit not allowed for both ESS 405 and SOCR 405.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 411 Earth Systems Ecology Credits: 3 (3-0-0)
Course Description: Earth as a system, stressing ecological interactions among energy, water, and biogeochemistry.
Prerequisite: ESS 311 and ESS 312.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 412 Sustainable Cities Credits: 3 (3-0-0)
Course Description: Explore the ecology of cities, evaluate the most innovative science developed for the city, and discuss with renowned researchers leading these efforts. Analyze sustainability plans from a variety of cities around the globe, and interact with the practitioners developing and implementing sustainable goals. Delve into sustainability theory, specifically "the sustainable city myth."
Prerequisite: ANTH 100 or ANTH 200 or ESS 210 or GES 101 or GR 100 or GR 210 or LAND 220 or LIFE 220 or LIFE 320 or NR 120A or NR 130 or SOC 220.
Registration Information: Junior standing. Credit not allowed for both ESS 412 and ESS 480A1.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 415 Sustainability Solutions Credits: 3 (3-0-0)
Course Description: The integration of skills and knowledge in ecosystems and sustainability to analyze data and develop solutions for sustainability issues as presented in case study scenarios.
Prerequisite: ESS 311 and ESS 312 and ESS 330.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 432 Microbial Ecology Credits: 3 (2-0-1)
Also Offered As: MIP 432.
Course Description: Principles of microorganism interactions with their living and non-living environments; implications for the environment, plants, and animals.
Prerequisite: MIP 300.
Registration Information: Must register for lecture and recitation. Credit not allowed for both ESS 432 and MIP 432.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

ESS 433 Microbial Ecology Laboratory Credit: 1 (0-3-0)
Also Offered As: MIP 433.
Course Description: Experimental microbial ecology; the design, conduct and interpretation of experiments that illustrate basic principles of microbial ecology.
Prerequisite: MIP 300.
Registration Information: Must be taken concurrently with ESS 432 or MIP 432. Credit not allowed for both ESS 433 and MIP 433.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

ESS 440 Practicing Sustainability Credits: 4 (2-0-2)
Course Description: Capstone integration of ecosystem science and sustainability, focused on case studies.
Prerequisite: ESS 311 and ESS 312.
Registration Information: Senior standing in WCNR. Must register for lecture and recitation.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 471 Special Topics in Ecosystem Sustainability Credits: Var[1-6] (0-0-0)
Course Description:
Prerequisite: ESS 311.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 474 Limnology Credits: 3 (2-2-0)
Course Description: Biology, chemistry, and physics of lakes including limnological methods.
Prerequisite: LAND 220 or LIFE 220 or LIFE 320.
Registration Information: Must register for lecture and laboratory. Required field trips. Credit not allowed for both BZ 474 and ESS 474.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: Yes.

ESS 486 Ecosystem Practicum Credits: 2 (0-0-4)
Course Description: One-week field practicum to examine ecosystem science and sustainability issues in Colorado landscapes.
Prerequisite: ESS 311.
Registration Information: Senior standing. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 487 Internship Credits: Var[1-6] (0-0-0)
Course Description: Supervised work experience in professional settings related to Ecosystem Science and Sustainability.
Prerequisite: ESS 320.
Registration Information: Written consent of instructor.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

ESS 495 Independent Study in Ecosystem Science Credits: Var[1-6] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

ESS 498 Research Credits: Var[1-6] (0-0-0)
Course Description: Mentored research in ecosystem science, sustainability science, watershed science, or related fields.
Prerequisite: (ESS 210 or GR 210 or LIFE 320 or STAT 301 or STAT 307 or STAT 315) and (ESS 220, may be taken concurrently or ESS 221, may be taken concurrently).
Restriction: Must not be a: Freshman.
Registration Information: Sophomore standing.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 500 Ecosystem Sustainability for Professionals Credits: 3 (3-0-0)
Course Description: Investigate major sustainability challenges through interdisciplinary analysis and applied field experiences. Emphasis is placed on evaluating sustainability-related data for professional application, communicating key concepts effectively, and integrating insights from fieldwork, guest speakers, and career pathway discussions.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing. Required field trips. Admission to the Professional Science Master's in Ecosystem Science and Sustainability. Field trip dates take place prior to the start of the semester, course fee required. Sections may be offered: Mixed Face-to-Face and Online. Credit is not allowed for both ESS 500 and ESS 501.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

ESS 501 Ecosystem Sustainability for Researchers Credits: 3 (3-0-0)
Course Description: Explores core ecological and social sustainability concepts across diverse ecosystems and communities. Investigate major sustainability challenges through interdisciplinary analysis and applied field experiences. Emphasis is placed on critically evaluating sustainability-related data and academic literature, communicating key concepts effectively, and integrating insights from fieldwork and guest speakers to support students' research development.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing. Credit not allowed for both ESS 500 and ESS 501. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

ESS 505 International Climate Negotiations Credits: 2 (2-0-0)
Course Description: Preparation for international climate negotiations including the Framework Convention on Climate Change (UNFCCC), Conference of the Parties (COP) in locations around the world. Explore environmental sustainability issues on international teams with peers from other institutions. Teams examine environmental issues/policies through a research project, and have the opportunity to prepare for actual climate action negotiations.
Prerequisite: None.
Registration Information: Department approval required. This is a partial semester course. Credit not allowed for ESS 505 and ESS 581A3.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 506 Virtual International Climate Negotiations Credit: 1 (0-0-1)
Course Description: Provides hands-on experience in international climate negotiations including the Framework Convention on Climate Change (UNFCCC), Conference of the Parties (COP) in locations around the world through virtual participation. Explore environmental sustainability issues on international teams with peers from other institutions. Teams examine environmental issues/policies through a research project, and have the opportunity to participate in actual climate action negotiations.
Prerequisite: None.
Registration Information: Must have concurrent registration in ESS 505. Sections may be offered: Online. This is a partial semester course.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 516 Climate Justice and Policy Credits: 2 (2-0-0)
Also Offered As: NR 516.
Course Description: Overview on i) the unequal distribution of the benefits of natural resource use and the burdens of environmental degradation across spatiotemporal scales, and ii) the role of policy tools and approaches in creating, exacerbating, or addressing those inequalities. Examine environmental and climate justice (EJ/CJ) concepts, recognize environmental and climate inequalities, and learn how to integrate EJ/CJ considerations in policy analysis and review.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Bachelor's degree required. Credit not allowed for both ESS 516 and NR 516. Sections may be offered: Online.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

ESS 523A Environmental Data Science Applications: Introduction Credits: 5 (5-0-0)
Course Description: Explore tools and best practices for working with large environmental datasets primarily using the programming language R. Cover technical topics like: data types, file management, iteration, functional programming, debugging, code management and collaboration with git and GitHub. Use these tools to analyze environmental data using statistical approaches like: linear models, trend analysis, simple machine learning techniques.
Prerequisite: STAT 158 or STAT 301 with a minimum grade of D.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 523B Environmental Data Science Applications: Food and Agriculture Credits: 2 (2-0-0)
Also Offered As: SOCR 523B.
Course Description: Explore the application of data science to the analysis of food and agricultural systems. Examine the ways food and agricultural researchers utilize data science in contemporary scientific literature and in research taking place across campus. Work in a team to create, document, and communicate an analysis that utilizes data science techniques to answer questions about food and agricultural system functioning and/or sustainability.
Prerequisite: ESS 523A, may be taken concurrently or SOCR 523A, may be taken concurrently.
Registration Information: This is a partial semester course. Credit not allowed for both ESS 523B and SOCR 523B.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 523C Environmental Data Science Applications: Water Resources Credits: 2 (2-0-0)
Also Offered As: WR 523C.
Course Description: Focus on analyzing and understanding water resources. Examine key innovations in deep learning for hydrological prediction and model parameterization, with a focus on cutting-edge techniques and hands-on analyses.
Prerequisite: ESS 523A, may be taken concurrently or SOCR 523A, may be taken concurrently.
Registration Information: Sections may be offered: Online. This is a partial semester course. Credit not allowed for both ESS 523C and WR 523C.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 523D Environmental Data Science Applications: Reproducible Remote Sensing Models Credits: 2 (2-0-0)
Course Description: Practical methods related to open science remote-sensing analysis, with a focus on coding-derived remote sensing data processing and machine learning analysis in a reproducible research framework. Work is largely implemented in the R environment for statistical analysis and open science processes are emphasized. Learn to code a complete remote sensing workflow and be empowered toward future independent learning.
Prerequisite: (ESS 523A) and (GR 323 or NR 323 or GR 503 or NR 503 with a minimum grade of D).
Registration Information: This is a partial semester course. Sections may be offered: Mixed Face-to-Face.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 524 Foundations for Carbon/Greenhouse Gas Mgmt Credits: 3 (3-0-0)
Course Description: Foundations for understanding greenhouse gas emissions management and accounting.
Prerequisite: BZ 300 to 499 - at least 3 credits or CHEM 300 to 499 - at least 3 credits or LIFE 300 to 499 - at least 3 credits.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 525 Scope 3 Greenhouse Gas Emission Accounting Credit: 1 (1-0-0)
Course Description: Learn how to account for greenhouse gas emissions across the full value chain using leading greenhouse gas accounting tools.
Prerequisite: ESS 524.
Registration Information: This is a partial semester course. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 526 Voluntary Carbon Markets - Quality & Risk Credit: 1 (1-0-0)
Course Description: Explores quality, credibility, and risk in the Voluntary Carbon Market (VCM) for nature-based carbon removal. Examine the market's structure, standards, and regulatory trends, then assess real projects in teams. Emphasis is on technical and social dimensions of quality, with hands-on evaluation and 'client-ready' presentations.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Sections may be offered: Mixed Face-to-Face or Online. Graduate standing.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 527 Just Social-Ecological Transformations LatAm Credit: 1 (0-0-1)
Also Offered As: NRRT 527.
Course Description: Draws together scientists, practitioners, and frontline communities to foster learning in transdisciplinary science. Presentations and discussions integrate social and ecological perspectives, prioritize community engagement and knowledge co-production, and consider justice in addressing "wicked problems" like social-environmental sustainability, biodiversity and biocultural conservation, and climate change in Latin America.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing. Written consent of instructor. Credit not allowed for both ESS 527 and NRRT 527.
Terms Offered: Fall, Spring.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

ESS 530 Introduction to Carbon Markets Credit: 1 (1-0-0)
Course Description: Concepts including carbon markets and offsets, ecosystem services, natural capital investment, capital allocated to low-carbon enterprises, and more. Topics include net-zero movement, climate tech, and the role of non-state actors in shaping climate policy.
Prerequisite: None.
Registration Information: This is a partial semester course.
Term Offered: Spring.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

ESS 532 Ecological Climatology Credits: 3 (3-0-0)
Course Description: Focuses on the connections between ecosystems and climate including physical, chemical and biological interactions. Investigate global scale implications and the expected response of a coupled earth system under past and future climate change.
Prerequisite: ESS 300.
Restriction: Must not be a: Freshman, Sophomore.
Registration Information: Junior standing.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

ESS 542 Greenhouse Gas Policies Credits: 2 (0-0-2)
Course Description: Rules, regulations and standards for greenhouse gas management and accounting.
Prerequisite: ESS 524, may be taken concurrently.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 543 Global Climate Change Credits: 2 (2-0-0)
Also Offered As: ATS 543.
Course Description: Climate change science, climate change impacts, and climate change mitigation, including discussions of current topics in climate change.
Prerequisite: BZ 300 to 499 - at least 3 credits or CHEM 300 to 499 - at least 3 credits or LIFE 300 to 499 - at least 3 credits.
Registration Information: Sections may be offered: Online. Credit not allowed for both ATS 543 and ESS 543.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 545 Environ Data Sci-Greenhouse Gas Inventories Credits: 4 (2-4-0)
Course Description: Overview of data science methods for estimating greenhouse gas emissions and mitigation potential.
Prerequisite: (ESS 523A or STAR 511) and (ESS 524).
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 546 Env Data Sci Applications-Adv GHG Inventories Credits: 3 (3-0-0)
Course Description: Focuses on data science applications of advanced GHG emission modeling frameworks in order to conduct greenhouse gas inventories and mitigation analyses.
Prerequisite: ESS 545.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 554 Ecological and Social Agent-based Modeling Credits: 3 (2-2-0)
Also Offered As: ANTH 554.
Course Description: Exploring the use and making of agent-based models featuring interacting individuals in ecological and social simulation, with examples and projects.
Prerequisite: None.
Registration Information: Junior standing. Must register for lecture and laboratory. Credit allowed for only one of the following: ANTH 554, ESS 554, or NR 554.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

ESS 555 Life Cycle Assessment for Sustainability Credits: 3 (3-0-0)
Also Offered As: ANEQ 555.
Course Description: The quantitative and qualitative measure of cradle-to-grave impacts of products and services on the environment, the economy, and society.
Prerequisite: ANEQ 300 to 479 - at least 3 credits or BZ 300 to 479 - at least 3 credits or CHEM 300 to 479 - at least 3 credits or ENGR 300 to 479 - at least 3 credits or LIFE 300 to 479 - at least 3 credits.
Registration Information: Sections may be offered: Online. Credit allowed for only one of the following: ANEQ 555, ENGR 555, ESS 555, ENGR 581A1, or ESS 581A1.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 575 Models for Ecological Data Credits: 4 (3-2-0)
Course Description: Gaining insight about the operation of ecological processes using models and data.
Prerequisite: MATH 255 and STAT 340.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 582A Study Abroad--Europe and British Isles: UN Climate Change Conference (COP) Credit: 1 (0-0-1)
Course Description: Provides hands-on experience in international climate negotiations including the Framework Convention on Climate Change (UNFCCC), Conference of the Parties (COP) in locations around Europe/British Isles. Explore environmental sustainability issues on international teams with peers from institutions around the world. Teams examine environmental issues/policies through a research project, and have the opportunity to participate in actual climate action negotiations at the UN Climate Conference.
Prerequisite: None.
Registration Information: Must have concurrent registration in ESS 505. This is a partial semester course. Students should register for one of the following depending on where the conference is being held: ESS 582A, ESS 582B, ESS 582C, or ESS 582D.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 582B Study Abroad--Americas: UN Climate Change Conference (COP) Credit: 1 (0-0-1)
Course Description: Provides hands-on experience in international climate negotiations including the Framework Convention on Climate Change (UNFCCC), Conference of the Parties (COP) in locations in Latin America. Explore environmental sustainability issues on international teams with peers from institutions around the world. Teams examine environmental issues/policies through a research project, and have the opportunity to participate in actual climate action negotiations at the UN Climate Conference.
Prerequisite: None.
Registration Information: Must have concurrent registration in ESS 505. This is a partial semester course. Students should register for one of the following depending on where the conference is being held: ESS 582A, ESS 582B, ESS 582C, or ESS 582D.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 582C Study Abroad--Asia/Oceania: UN Climate Change Conference (COP) Credit: 1 (0-0-1)
Course Description: Provides hands-on experience in international climate negotiations including the Framework Convention on Climate Change (UNFCCC), Conference of the Parties (COP) in locations within Asia and Oceania. Explore environmental sustainability issues on international teams with peers from institutions around the world. Teams examine environmental issues/policies through a research project, and have the opportunity to participate in actual climate action negotiations at the UN Climate Conference.
Prerequisite: None.
Registration Information: Must have concurrent registration in ESS 505. This is a partial semester course. Students should register for one of the following depending on where the conference is being held: ESS 582A, ESS 582B, ESS 582C, or ESS 582D.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 582D Study Abroad--Africa: UN Climate Change Conference (COP) Credit: 1 (0-0-1)
Course Description: Provides hands-on experience in international climate negotiations including the Framework Convention on Climate Change (UNFCCC), Conference of the Parties (COP) in locations in Africa. Explore environmental sustainability issues on international teams with peers from institutions around the world. Teams examine environmental issues/policies through a research project, and have the opportunity to participate in actual climate action negotiations at the UN Climate Conference.
Prerequisite: None.
Registration Information: Must have concurrent registration in ESS 505. This is a partial semester course. Students should register for one of the following depending on where the conference is being held: ESS 582A, ESS 582B, ESS 582C, or ESS 582D.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 587 Internship Credits: Var[1-6] (0-0-0)
Course Description:
Prerequisite: ESS 523A.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

ESS 625 Ecology of Forest Production Credits: 3 (3-0-0)
Also Offered As: F 625.
Course Description: Develops student expertise in understanding carbon and nutrient flows in forests.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Must have taken a 300-level course in ECOL. Credit not allowed for both ESS 625 and F 625. Sections may be offered: Online.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

ESS 650 Edge Effects--Place, Embodiment, Environment Credits: 3 (3-0-0)
Also Offered As: ANTH 650.
Course Description: Interdisciplinary thinking on questions of place, power, embodiment, and environmental adaptation. Drawing on human geography, ethnography, political ecology, and social-ecological theory, develop an understanding of boundaries and transitional zones as places of complex social and species exchange by looking at some key philosophical texts, but also applying theoretical understanding to specific case studies.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Credit not allowed for both ANTH 650 and ESS 650.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

ESS 660 Biogeochemical Cycling in Ecosystems Credits: 3 (3-0-0)
Course Description: Biotic and abiotic processes responsible for distribution and fluxes of elements at ecosystem, landscape, and global scales.
Prerequisite: ECOL 500 to 699 - at least 3 credits or ESS 500 to 699 - at least 3 credits.
Restriction: Must be a: Graduate, Professional.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

ESS 692 Seminar Credit: 1 (0-0-1)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Sections may be offered: Online.
Terms Offered: Fall, Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

ESS 695 Independent Study in Ecosystem Science Credits: Var[1-6] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

ESS 696 Group Study Credits: Var[1-6] (0-0-0)
Course Description: Group study projects on topics in ecosystem science and sustainability.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of instructor. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

ESS 698 Research Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of advisor.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

ESS 699 Thesis Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of advisor.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

ESS 798 Research Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of advisor.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.

ESS 799 Dissertation Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Written consent of advisor.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.